

Bellwork: 1/14/13

Solve the following quadratic equation:

$$2x^2 + 7 = 6x$$

$-6x$

$$2x^2 - 6x + 7 = 0$$

$$a = 2 \quad b = -6 \quad c = 7$$

$$\begin{array}{c} 20 \\ \swarrow \searrow \\ 4 \quad 5 \\ \swarrow \searrow \\ \textcircled{22} \end{array}$$

$$\frac{6 \pm \sqrt{(-6)^2 - 4(2)(7)}}{2(2)}$$

$$\frac{6 \pm \sqrt{-20}}{4} = \frac{6 \pm i\sqrt{20}}{4}$$

$$= \frac{6 \pm 2i\sqrt{5}}{4}$$

$$\textcircled{-\frac{3 \pm i\sqrt{5}}{2}}$$

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$$\textcircled{29} \frac{(4-3i)(-1+4i)}{(-1-4i)(-1+4i)} = \frac{-4 + 16i + 3i - \cancel{12i^2}^{+12}}{1 - \cancel{4i} + \cancel{4i} - \cancel{16i^2}^{+16}}$$

$$= \frac{8 + 19i}{17}$$

$$\textcircled{27} \frac{(3-2i) - 5i}{5i - 5i} = \frac{17 - 10i - 15i + \cancel{10i^2}^{+10}}{-25i^2 \quad 25}$$

$$= \frac{-10 - 15i}{25}$$

$$\textcircled{-\frac{2-3i}{5}}$$

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④ $2x^2 - 4x + 7 = 0$

$$\frac{4 \pm \sqrt{(-4)^2 - 4(2)(7)}}{2(2)}$$

$$\frac{4 \pm \sqrt{-40}}{4}$$

$$\frac{4 \pm i\sqrt{40}}{4} = \frac{4 \pm 2i\sqrt{10}}{4} = \frac{2 \pm i\sqrt{10}}{2}$$

$$\begin{array}{c} 40 \\ \swarrow \searrow \\ 4 \quad 10 \\ \swarrow \searrow \swarrow \searrow \\ \textcircled{2} \quad 2 \quad 5 \end{array}$$

Section 4.5 - Writing Quadratic Equations GIVEN THE ROOTS

The roots of an equation is a value that makes the equation true.

*** roots = zeros = x intercepts = answers ***

Remember:

If 3 is a root of a function, then $(x-3)$ is a factor.

If -2 is a root of a function, then $(x+2)$ is a factor.

example 1: Write a quadratic equation with roots at -2 and 3.

Roots: -2 3
 ↳ Factors: $(x+2)$ $(x-3)$
 $x^2 - 3x + 2x - 6$
 ↳ Equation: $x^2 - x - 6 = 0$

example 2: Write a quadratic equation with roots at -6 and -3.

Roots: -6 -3

↙ Factors: $(x+6)(x+3)$

$x^2 + 3x + 6x + 18$

↘ Equation: $x^2 + 9x + 18 = 0$

example 3: Write a quadratic equation with roots at -1 and 4.

example 4: Write a quadratic equation with roots at 5 and -5.

Roots: 5 -5

Factors: $(x-5)(x+5)$
 $x^2 + \cancel{5x} - \cancel{5x} - 25$

Equation: $x^2 - 25 = 0$

example 5: Write a quadratic equation with roots at 0 and -2.

Roots: 0 -2

Factors: $(x-0)(x+2)$
 $x(x+2)$

Equation: $x^2 + 2x = 0$

example 6: Write a quadratic equation with roots at $\frac{1}{2}$ and $-\frac{3}{4}$.

Roots: $\frac{1}{2}$ $-\frac{3}{4}$

Factors: $(x - \frac{1}{2})(x + \frac{3}{4})$

$$(2x - 1) = 0 \quad (2x - 1)(4x + 3)$$

$$2x = 1$$

$$x = \frac{1}{2}$$

$$8x^2 + 6x - 4x - 3$$

Equation: $8x^2 + 2x - 3 = 0$

example 7: Write a quadratic equation with roots at $\frac{2}{3}$ and $\frac{3}{2}$.

Roots: $\frac{2}{3}$ $\frac{3}{2}$ $(x - \frac{2}{3})(x - \frac{3}{2})$

Factors: $(3x - 2)(2x - 3)$

$$6x^2 - 9x - 4x + 6$$

Equation: $6x^2 - 13x + 6 = 0$

Homework:

Quadratic Review Packet

1-21

